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Plantar Fasciitis

What is plantar fasciitis?

By Jonathan Cluett, M.D., About.com *Updated: August 20, 2008*

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Plantar fasciitis is a common, painful foot condition. Patients, and sometimes doctors often confuse the terms plantar fasciitis and heel spurs[1]. **Plantar fasciitis** refers to the syndrome of inflammation of the band of tissue that runs from the heel along the arch of the foot; a **heel spur**[2] is a hook of bone that can form on the heel bone (calcaneus). About 70% of patients with plantar fasciitis have been noted to have a heel spur that can be seen on X-Ray.

Who gets plantar fasciitis?

Plantar fasciitis is most often seen in middle-aged men and women, but can be found in all age groups. Plantar fasciitis is diagnosed with the classic symptoms of pain well localized over the heel area of the bottom of the foot. Often the pain from plantar fasciitis is most severe when you first stand on your feet in the morning. Pain often subsides quite quickly, but then returns after prolonged standing or walking.

Plantar fasciitis is sometimes, but not always, associated with a rapid gain of weight. Plantar fasciitis is also sometimes seen in recreational athletes, especially runners. In these athletes, it is thought that the repetitive nature of the sports causes the damage to the fibrous tissue that forms the arch of the foot.

Could something other than plantar fasciitis cause this pain?

Plantar fasciitis can be confused with a condition called tarsal tunnel syndrome[3]. In tarsal tunnel syndrome, an important nerve in the foot, the tibial nerve, is trapped and pinched as it passes through the tarsal tunnel, a condition analogous to carpal tunnel syndrome[4] in the wrist. This may cause symptoms similar to the pain of a plantar fasciitis.

There are also other less common problems such as nerve entrapments, stress fractures, and fat pad necrosis, all of which can cause foot pain. Finally, several rheumatologic conditions can cause heel pain. These syndromes such as Reiter's syndrome[5] and ankylosing spondylitis[6] can cause heel pain similar to plantar fasciitis. If your symptoms are not typical for plantar fasciitis, or if your symptoms do not resolve with treatment, your doctor will consider these possible diagnoses.

Why did I get plantar fasciitis?

Plantar fasciitis occurs because of irritation to the thick ligamentous connective tissue that runs from the heel bone to the ball of the foot. This strong and tight tissue contributes to maintaining the arch of the foot. It is also one of the major transmitters of weight across the foot as you walk or run. Therefore, the stress placed on the this tissue is tremendous.

When a patient has plantar fasciitis, the connective tissue that forms the arch of the foot becomes inflamed (tendonitis) and degenerative (tendinosis)--these abnormalities cause plantar fasciitis and can make normal activities quite painful.

Symptoms of plantar fasciitis are typically worsened early in the morning after sleep. At that time, the arch

Exhibit D

tissue is tight and simple movements stretch the contracted tissue. As you begin to loosen the foot, the pain usually subsides, but often returns with prolonged standing or walking.

Treatment of plantar fasciitis is with short-term rest and controlling the inflammation. Here are the steps patients should take in order to cure their plantar fasciitis:

- **Rest**
  Avoiding the precipitating activity; for example, take a few day off jogging or prolonged standing/walking. Just resting usually helps to eliminate the most severe pain, and will allow the inflammation to begin to cool down.

- Apply Ice Packs[7]
  Icing will help to diminish some of the symptoms and control the heel pain. Icing is especially helpful after an acute exacerbation of symptoms.
  - A great way to ice plantar fasciitis[8]

- Exercises and Stretches[9]
  Exercises and stretches are designed to relax the tissues that surround the heel bone. Some simple exercises, performed in the morning and evening, often help patients feel better quickly.

- Anti-Inflammatory Medications[10]
  Anti-inflammatory medications help to both control pain and decrease inflammation. Over-the-counter medications are usually sufficient, but prescription options are also available.

- Shoe Inserts[11]
  Shoe inserts are often the key to successful treatment of plantar fasciitis. The shoe inserts often permit patients to continue their routine activities without pain.

- Night Splints[12]
  Night splints are worn to keep the heel stretched out when you sleep. By doing so, the arch of the foot does not become contracted at night, and is hopefully not as painful in the morning.

These modalities alone will cure the plantar fasciitis pain in most patients. Be forewarned that the symptoms will not resolve quickly. Most patients find relief within about three months, and over 90% within one year.

If the pain does not resolve, an injection of cortisone[13] can decrease the inflammation of plantar fasciitis. However, many physicians do not like to inject cortisone because there are potentially serious problems with cortisone injections in the heel area. The two problems that cause concern are fat pad atrophy and plantar fascial rupture. Both of these problems occur in a very small percentage of patients, but they can cause a worsening of heel pain symptoms.

A new treatment for chronic plantar fasciitis is being investigated. This treatment, called extracorporeal shock wave therapy, or ESWT, uses energy pulses to induce microtrauma to the tissue of the plantar fascia. This microtrauma is thought to induce a tissue repair process by the body. ESWT is recommended in patients who have failed the previously mentioned treatments, and are considering surgical options. For more information on shock wave therapy treatment:

- Extracorporeal Shock Wave Therapy[14]

After successful treatment, how can I prevent plantar fasciitis from coming back?
To prevent the recurrence of plantar fasciitis after treatment, proper fitting footwear is essential. Many people use shoe inserts to relieve pressure over the tender area. Custom orthotics can also be made if there appears to be a problem with the mechanical structure of the foot. It is also important to continue the stretching and exercises[15]. These simple exercises will help maintain the flexibility of the foot and prevent the plantar fasciitis pain from returning.

What if the symptoms of plantar fasciitis do not resolve?
In a small number of cases (usually less than 5%), patients may not experience relief after trying the recommendations listed above. It is important that conservative treatments (such as those listed above) be performed for AT LEAST a year before considering surgery[16]. Time is very important in curing the pain of plantar fasciitis, and insufficient treatment before surgery may subject you to potential complications of the procedure. If these treatments fail, your doctor may consider an operation[17] to loosen the plantar fascia, called a plantar fascia release. For more information about plantar fascia release:

- Plantar Fascia Release[18]

Because the diagnosis of plantar fasciitis can be confused with tarsal tunnel syndrome (as described earlier), most surgeons advocate performing a tarsal tunnel release (or at least a partial tarsal tunnel release) along with the plantar fascia release. This surgery is about 80% successful in relieving pain in the small group of patients who do not improve with conservative treatments.

Surgery is rarely needed in the treatment of plantar fasciitis. The vast majority of patients diagnosed with plantar fasciitis will recover given ample time. With some basic treatment steps[19], well over 90% of patients will achieve full recovery from symptoms of plantar fasciitis within one year of the onset of treatment.

What if my symptoms of plantar fasciitis do not resolve with time?
As stated above, simple treatment measures[20] will usually work in the treatment of plantar fasciitis. These treatments include anti-inflammatory medication, shoe inserts, and stretching exercises. In cases where a good effort with these treatments fails to provide adequate relief, some more aggressive treatments may be attempted. These include cortisone injections[21] or extracorporeal shock wave treatments[22].

When does surgery for plantar fasciitis become a treatment option?
Surgery should be reserved for patients who have made every effort to fully participate in conservative treatments, but continue to have pain from plantar fasciitis. Patients should fit the following criteria:

- Symptoms for at least 9 months of treatment
- Participation in daily treatments (exercises, stretches, etc.)
- Understanding of the potential risks and benefits of surgery

If you fit these criteria, then surgery may be an option in the treatment of your plantar fasciitis.

What are the risks of surgery for plantar fasciitis?
Unfortunately, surgery for treatment of plantar fasciitis is not as 'predictable' as a surgeon would like.

What I mean by this, is surgeons can reliably predict that patients with severe knee arthritis[23] will do well after knee replacement surgery[24] about 95% of the time. Those are very good results. Unfortunately, the same is not true of patients with plantar fasciitis.

Some of the complications of surgery for plantar fasciitis include:

- **Over release of the plantar fascia**
  When your surgeon releases the plantar fascia, it is important to only release about 30-50% of the fascia. Release of more of the plantar fascia during surgery may cause a flat foot deformity due to the loss of the arch of the foot. Flat foot after surgery can lead to chronic problems that may be as bad as the plantar fasciitis.

- **Nerve injury to the foot**
  There are small nerves that travel just adjacent to the plantar fascia. These nerves, even with protection, may be damaged during surgery to release of the plantar fascia. Because of this, a small percentage of patients may have pain or numbness in areas of the foot following plantar fasciitis surgery.

- **Persistence of symptoms**
  As stated earlier in this article, pain around the heel of the foot may not always be due to plantar fasciitis. Symptoms of plantar fasciitis[25] may closely resemble symptoms of other foot problems[26]. Therefore, some patients may not find relief of their symptoms even after surgery.

- **Infection**
  Unfortunately, infection is a possible complication after any surgery. If a patient sustains an infection following surgery, they will require antibiotics and may require further surgery to remove any infection.

Is plantar fasciitis surgery worth these risks?
Well, that is a question you need to decide in consultation with your orthopedic surgeon. Surgery for plantar fasciitis can be very successful in the right patients. While there are potential complications, about 70-80% of patients will find relief after plantar fascia release surgery. This may not be perfect, but if plantar fasciitis has been slowing you down for a year or more, it may well be worth these potential risks of surgery.

What about endoscopic plantar fascia release?
New surgical techniques allow surgery to release the plantar fascia to be performed through small incisions using a tiny camera to locate and cut the plantar fascia. This procedure is called an endoscopic plantar fascia release. Some surgeons are concerned that the endoscopic plantar fascia release procedure increases the risk of damage to the small nerves of the foot. While there is no definitive answer that this endoscopic plantar fascia release is better or worse than a traditional plantar fascia release, most surgeons still prefer the traditional approach.

Sources:

Gill LH. "Plantar Fasciitis: Diagnosis and Conservative Management[27]" J. Am. Acad. Ortho. Surg., Mar 1997; 5: 109 - 117.

Riddle, DL, et al. "Risk Factors for Plantar Fasciitis[28]" J. Bone Joint Surg. Am., May 2003; 85: 872 - 877.

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